Estimating the static friction law of a forced double torsion pendulum using physics-informed neural networks

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The exploration of dynamics and vibrations in engineering systems, supported by theoretical advancements and practical implementations is currently undergoing thorough investigation. This study focuses on utilizing a physics-informed neural network [1, 2] to identify frictional law in a torsional planar contact of solid bodies [3, 4]. Through modeling and parameter identification using discrete measurement data collected from an experimental laboratory station, numerical and experimental methods tailored for non-smooth systems are applied. In summary, the presentation includes a case study demonstrating the network's capability to predict non-smooth dynamic models behavior and estimate planar friction in a double torsion pendulum system, showcasing its accuracy and efficiency compared to other known methods [5].

References

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